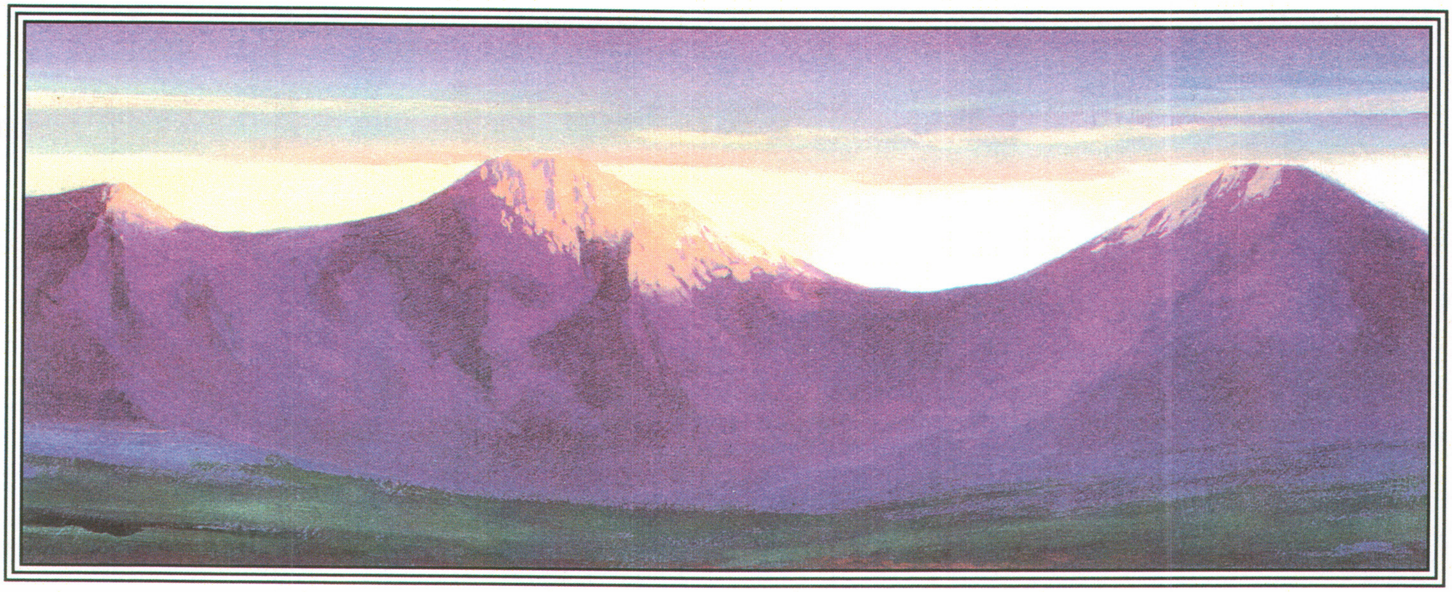
APPENDIX 7-61

MILL FORK RESISTIVITY STUDY, 2001

AQUA TRACK



RESISTIVITY SURVEY

Sunrise Project No. E9692.48
January 16, 2001

Prepared for:

GENWAL Resources
195 North 100 West
P.O. Box 1410
Huntington, Utah 84528

Prepared by:

Sunrise Engineering, Inc.
12227 South Business Park Drive, Suite 220
Draper, UT 84020
Phone: 801-523-0100
Fax: 801-523-0990

SUNRISE ENGINEERING INC.

SUNRISE ENGINEERING INC.

SUNRISE ENGINEERING INC.
12227 South Business Park Drive • Suite 220
Draper, Utah 84020
Tel (801) 523-0100 • Fax (801) 523-0990

FILLMORE, UT
MESA, AZ
BOISE, ID
AFTON, WY
WASHINGTON, UT
SALT LAKE CITY, UT
BULLHEAD CITY, AZ
PRESCOTT VALLEY, AZ

January 18, 2001

Mr. Dave Shaver
GENWAL Resources
195 North 100 West
Huntington, Utah 84528

RE: Resiitivity Survey
Huntington, Utah
Sunrise Project No. E9692.48

Dear Mr. Shaver:

Enclosed herein is the report for the phase I resistivity survey conducted in Mill Fork Canyon. The information in this report relates only to the study area and should not be extrapolated or construed to apply to other areas. The information, recommendations and conclusions provided herein apply to the study area, as they existed at the time when this report was prepared.

We will be preparing our proposal for the second phase of this study. Phase two consists of an AquaTrack survey above and to the north of Little Bear Spring to determine were the northern extension of the fault is located that feeds into Little Bear Spring. This second phase work can not start until after the spring runoff is over. We plan to submit this second phase proposal to you by the end of February 2001.

We appreciate this opportunity to be of service to you. If you have any questions regarding this report, please feel free to contact us at (801) 523-0100 or (435) 743-6151.

Sincerely,

SUNRISE ENGINEERING, INC.

Calvin George For

Jerry R Montgomery, Ph.D.
Senior Geophysicist

Val O. Kofoed

Val Kofoed, P.E.
Principal Engineer

EXECUTIVE SUMMARY

This report presents our findings for phase 1 resistivity survey conducted for GENWAL Resources, Inc. The survey was performed in Mill Fork Canyon near Huntington, Utah. The purpose of this survey was to identify the bedrock/alluvial interface and present cross-sections to show the saturated alluvial zones above the bedrock.

Two cross sections were surveyed and plotted. The first was at the end of the vehicle access road in Mill Fork Canyon. The second was about one mile further up Mill Fork Canyon.

The thickness of the saturated sediments was estimated to range from 0 to 30 feet in the lower study area. In the upper area the thickness of the saturated sediments was determined to range from 0 to 50 feet.

The cross sectional area of the saturated sediments was about 2,000 square feet at the lower resistivity profile and 3,300 square feet at the upper resistivity profile.

The survey also revealed that groundwater in the surveyed profiles flows from the canyon slopes into the canyon creek. Depth to groundwater in the surveyed area ranged from 0-30 feet.

The data indicates that there is an approximately 1,300-square-foot difference in area of saturated sediments between the two surveyed profiles.

TABLE OF CONTENTS

PAGE NO.

LETTER OF TRANSMITTAL i

EXECUTIVE SUMMARY ii

1.0 INTRODUCTION 1

2.0 FIELD SURVEY 1

2.1 Equipment 1
2.2 Setup and Station Location 2
2.3 Readings 4

3.0 DATA ANALYSIS AND INTERPRETATION 7

4.0 SURVEY RESULTS 7

5.0 CONCLUSION 9

RESISTIVITY SURVEY

Sunrise Project No. E9692.48
January 18, 2001

1.0 INTRODUCTION

This report presents our findings of the first phase resistivity survey conducted for GENWAL Resources, Inc. in Mill Fork Canyon near Huntington, Utah (see **Figure 1**.) A second phase survey will be performed this coming spring/summer in Little Bear Canyon.

A resistivity profiling technique was used in the survey. The purpose of this survey was to estimate the volume of alluvium saturated with groundwater both below and above a fault that is feeding the Little Bear Spring. This study will help estimate the amount of water lost from the alluvium in Mill Fork Canyon through the fault and the amount of water contributing to the Little Bear Spring.

Two resistivity profiles were surveyed. **Figure 2** shows the profile locations in Mill Fork Canyon. **Figure 2** indicates that Mill Fork Canyon is approximately west-east trending in our study area. The surface elevation in the study area is about 8,000 feet above mean sea level.

The fieldwork was conducted during November 27 through December 1, 2000.

Data gathered during the fieldwork was reduced and analyzed. Models were established which show the alluvium profiles and water depths.

2.0 FIELD SURVEY

2.1 Equipment

The equipment used in this survey consisted of two components: a transmitter component and a receiver component.

- The transmitter component consisted of the following four items:

    1. A Honda power 500 watt generator
    2. An Elgar AC power source model 501SL
    3. An impedance matching box, and
    4. An AC to DC converter.

- The receiver was a fluke multi meter with a sensitivity of 0.1 millivolts.

2.2 Setup and Station Location

The stations for the setup of both lower and upper profiles were similar except for the length of the profile. The lower profile #2 was 200 feet long, while the upper profile #1 was 300 feet long. The profile locations are shown in **Figure 2**.

For each survey profile, two transmitting electrodes (one reference transmitting electrode and one roving transmitting electrode) were used.

The lower profile #2 was located at the top of a road (FDR 245, a vehicle accessible road) and extended from the bedrock slope on the north side of the canyon to the bedrock slope on the south side of the canyon. This distance was 200 feet. Readings were taken from both sides of the profile, from north to south then from south to north.

For the 200-foot long profile #2, the reference transmitting electrode was placed at one end of the profile line (200-foot mark) and the roving transmitting electrode was first placed at the 150-foot mark. **Figure 3** (Diagram 2) shows the transmitting electrode setup for profile #2. After the first setup was done, reading from the receiver was then taken for the rest of the profile following specific spacing rules that will be discussed in the next section.

After the reading was taken for the first setting, the roving transmitting electrodes was moved 50 feet and placed at the 100-foot mark while the reference transmitting electrode remained at the 200-foot mark. Readings at the receiver were taken for different survey locations along profile #2.

After readings were taken along the profile under the second setting, the roving transmitting electrode was moved for another 50 feet from the 100-foot mark to the 50-foot mark and readings were taken again.

A reverse setup was then used to take readings again. The first reverse setting was to locate the reference transmitting electrode at the beginning (0) of profile #2 and the roving transmitting electrode at the 50-foot mark; the second and third settings were to move the roving electrode to the 100-foot and 150-foot marks, respectively, while the reference electrode remained at 0. **Figure 4** (Diagram 3)shows the first reverse setting.

The upper profile #1 was approximately one mile further west into Mill Fork Canyon. This profile was also from bedrock on the north to bedrock on the south. The length of this profile was 300 feet from side to side. Readings were taken in both directions from north to south and then from south to north as described for the lower profile. The electrode setup process used on the lower profile #2 was also applied to the upper profile #1.

Figure 1. Location Map (Huntington, UT)

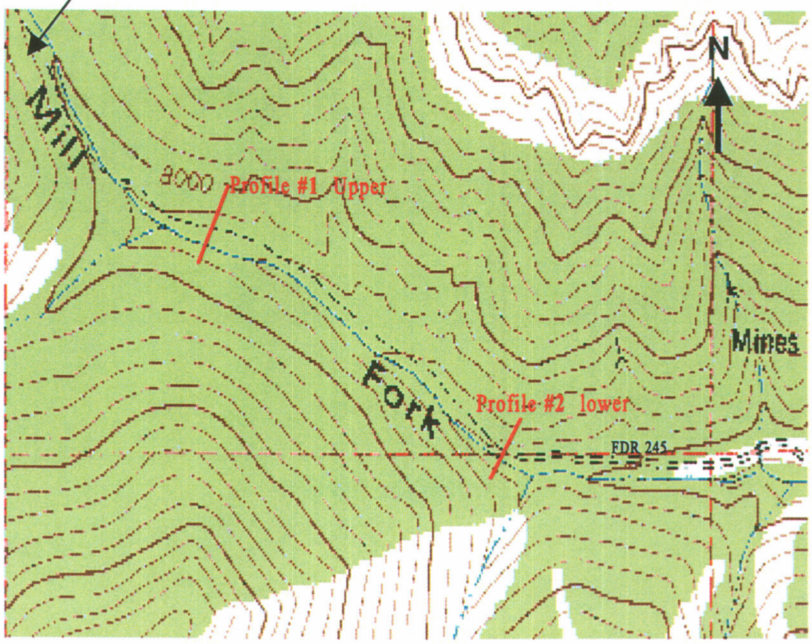


Figure 2. Site Vicinity Map

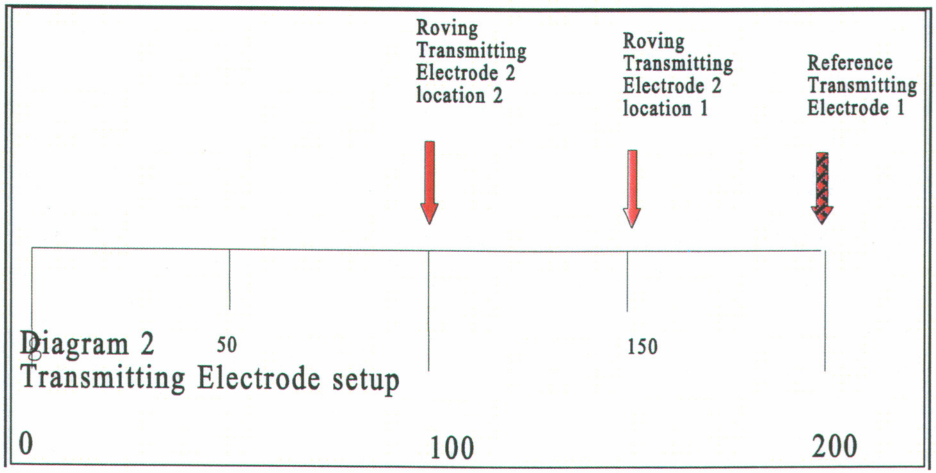


Figure 3. Transmitting Electrode Setup for Profile #2 (Looking West)

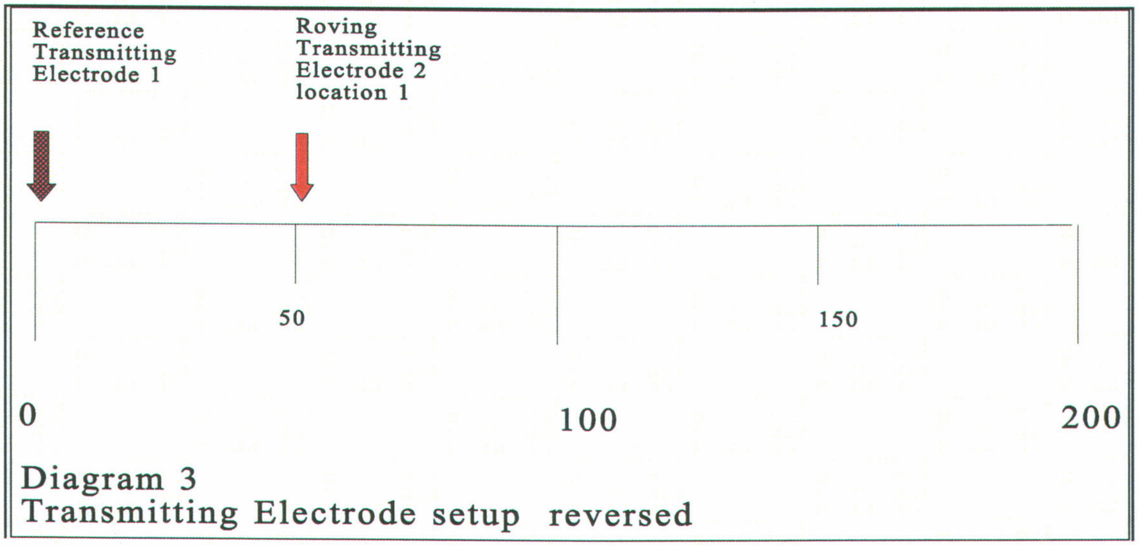


Figure 4. Transmitting Electrode Set Reversed for Profile #2 (Looking West)

2.3 Readings

The readings on profile #2 were conducted by placing a reference receiving (potential) electrode at the opposite end of the line to the reference transmitting electrode. When the transmitting reference electrode had been placed at the 200-foot mark for profile #2, the receiving reference electrode was placed at 0 on the southern side. The roving receiving (potential) electrode was placed on a logarithmic scale starting 5 feet from the roving transmitting electrode or at the 145-foot mark on the profile for the first setting as described in Section 2.2. After the first reading was taken from the 145-foot mark, the roving receiving electrode was moved to the next location. The roving receiving electrode locations for the first setting is shown in **Figure 5** (Diagram 4).

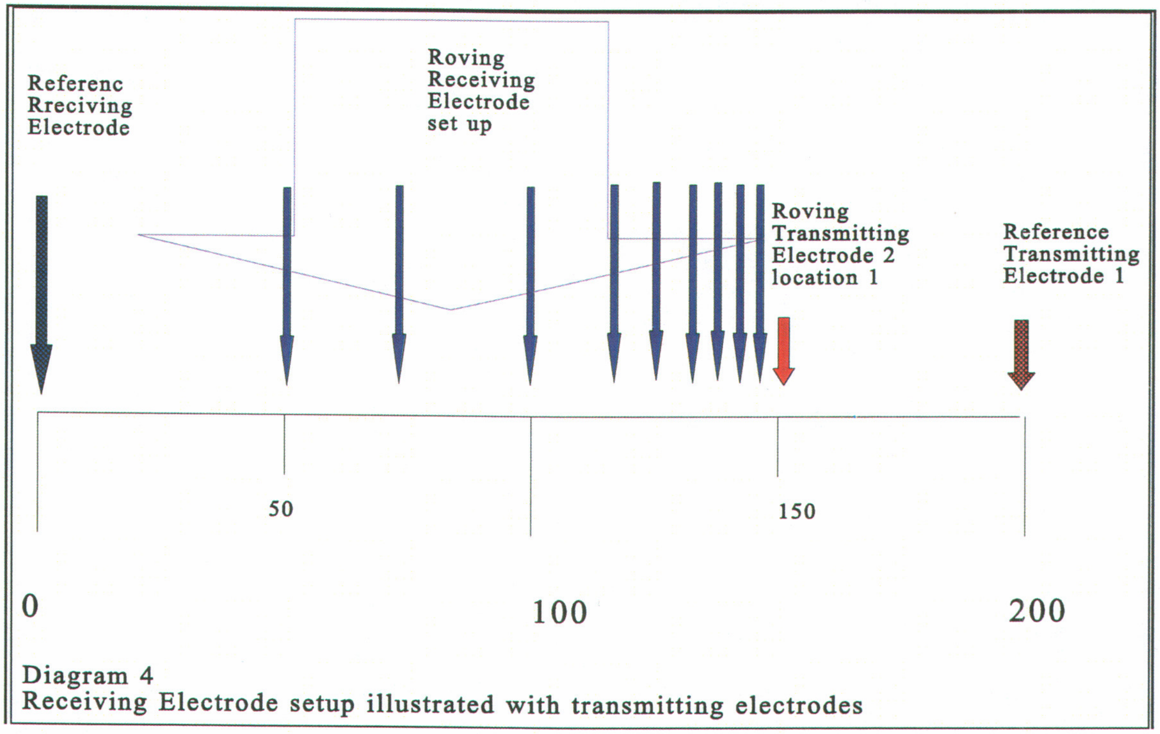


Figure 5. Receiving and Transmitting Electrode Setup for Profile #2 (Looking West)

Readings were taken along the profile in the following sequence of feet from the roving transmitting electrode: 5, 7, 10, 15, 20, 30, 50, 70, 100. These readings were taken from foot marks of 145, 143, 140, 135, 130, 120, 100, 80 and 50 one by one where the roving electrode was located, as shown in **Figure 5**. The maximum number of readings were collected for each roving transmitting electrode setting. Readings were taken until the end of the profile was reached. Thus the distance between the receiving electrodes (reference and roving) becomes progressively smaller while the distance between receiving roving transmitting electrode and the reference transmitting electrodes increased.

After the first set of readings were taken, the roving transmitting electrode was moved to the 100-foot mark as described above and reading were taken again on the same logarithmic scale. Thus, the next reading was taken at the 95-foot mark on the line then at 93, 90, 85, 80, 70, 50, 30. The 30-foot mark was the last reading position prior to bedrock at 0 at the southern end of the profile.

The same procedure was repeated with the roving transmitting electrode at the 50-foot mark. The next reading was taken at the 45-foot mark on the line and then at 43, 40, 35, 30 and 20. The 20-foot mark was the last reading position prior to the bedrock at 0 at the southern end of the profile.

All readings were taken using a Fluke multi-meter. The multi-meter was used to measure the potential difference between its reference potential electrode and the roving potential electrode.

Figure 6 (Diagram 5) illustrates a similar setup for the 300-foot survey profile. This shows the transmitter electrodes set at 300 feet (reference electrode) and 200 feet (roving electrode) and the receiving (potential) electrodes at 0 (reference) and the logarithmic scale from 195 to 50 for the roving receiving (potential) electrode.

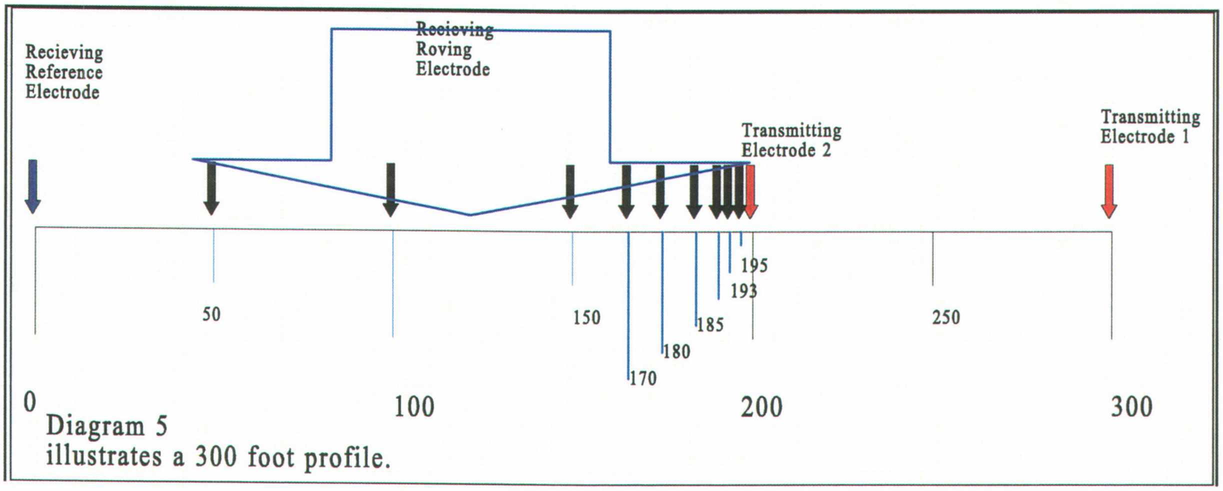


Figure 6. Electrode Setup for Profiled #1 (Looking West)

3.0 DATA ANALYSIS AND INTERPRETATION

The data was reduced using standard equations to determine resistivity based on the current from the transmitter, voltage measured at the receiver, and the geometric configuration of the electrodes.

The values obtained from the reduction of the data were used to develop the models of profiles #1 and #2. The models were developed by plotting the data as cross-sections and depth soundings.

The depth soundings were used to determine the depth to the top of the water table and the depth to bedrock. The depth to these two layers were determined for each fixed electrode positions along both profiles for both directions. This provided depth samples approximately every 50 feet for the entire length of the two profiles.

The data was also plotted in cross sectional form. The interpreted depths obtained from the sounding curves were then superimposed on those cross sections. The cross section and interpretation are included.

Using the cross sectional models obtained from the resistivity data, cross section blocks of saturated alluvium were identified. The area for each of these cross section blocks was calculated and summed to provide a total cross sectional area of saturated sediments for each profile. These calculations are provided in Survey Results.

4.0 SURVEY RESULTS

The two resistivity profiles for Mill Fork Canyon were measured so that both resistivity depth soundings (depth soundings) and cross sectional data would be gathered at the same time. Each depth sounding along the profiles was modeled against standard two- and three-layer sounding curves. The results of these comparisons were superimposed on the data plotted as a cross sectional profile. The resulting models are in **Figures 7 and 8**.

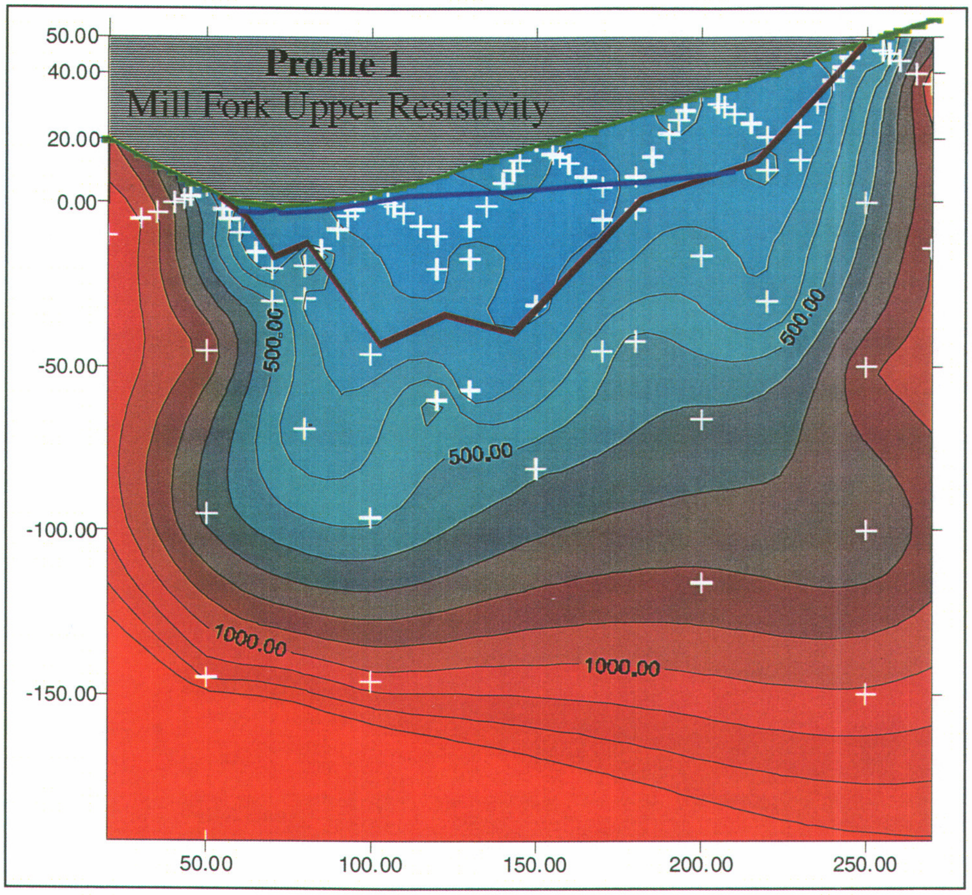


Figure 7. Resistivity Contour Map on Profile #1

Both profiles are plotted looking west with north on the right and south to the left. The coordinate units are in feet and the resistivity is in ohms.

The models are superimposed on the resitivity cross sections and include depth to the bedrock interface and depth to the watertable. The resistivity shown on the map is apparent resistivity. According to the book titled "*Fundamentals of Geophysics*" written by Williams Lowrie in 1997, the apparent resistivity for saturated sediment would be around 300-400 ohms.

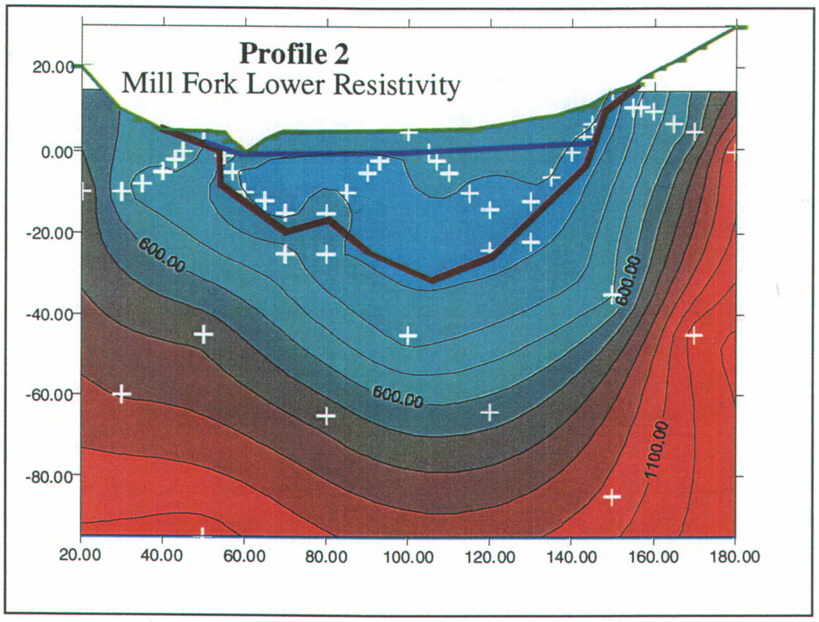


Figure 8. Resistivity Contour Map on Profile #2

In **Figures 7 and 8**, the interface between bedrock and saturated sediments is represented by a red line and the water table a blue line. The two figures indicate that groundwater flows to the canyon creek from both side of the canyon. The depth to water table ranges from 0 at and in the vicinity of the creek and about 30 feet at the foot of the northern slope in profile #1 and about 10 feet at the foot of the northern slope in profile #2. The maximum thickness of the saturated sediments is about 50 feet at profile #1 and roughly 30 feet at profile #2.

The cross sectional area for saturated sediment is estimated to be approximately 3,300 square feet at profile #1 and about 2,000 square feet at profile #2.

5.0 CONCLUSION

This report presents our findings of the resistivity survey conducted for GENWAL Resources, Inc. in Mill Fork Canyon near Huntington, Utah. The survey was performed to map the bedrock alluvial interface and the cross sectional area of the saturated zone.

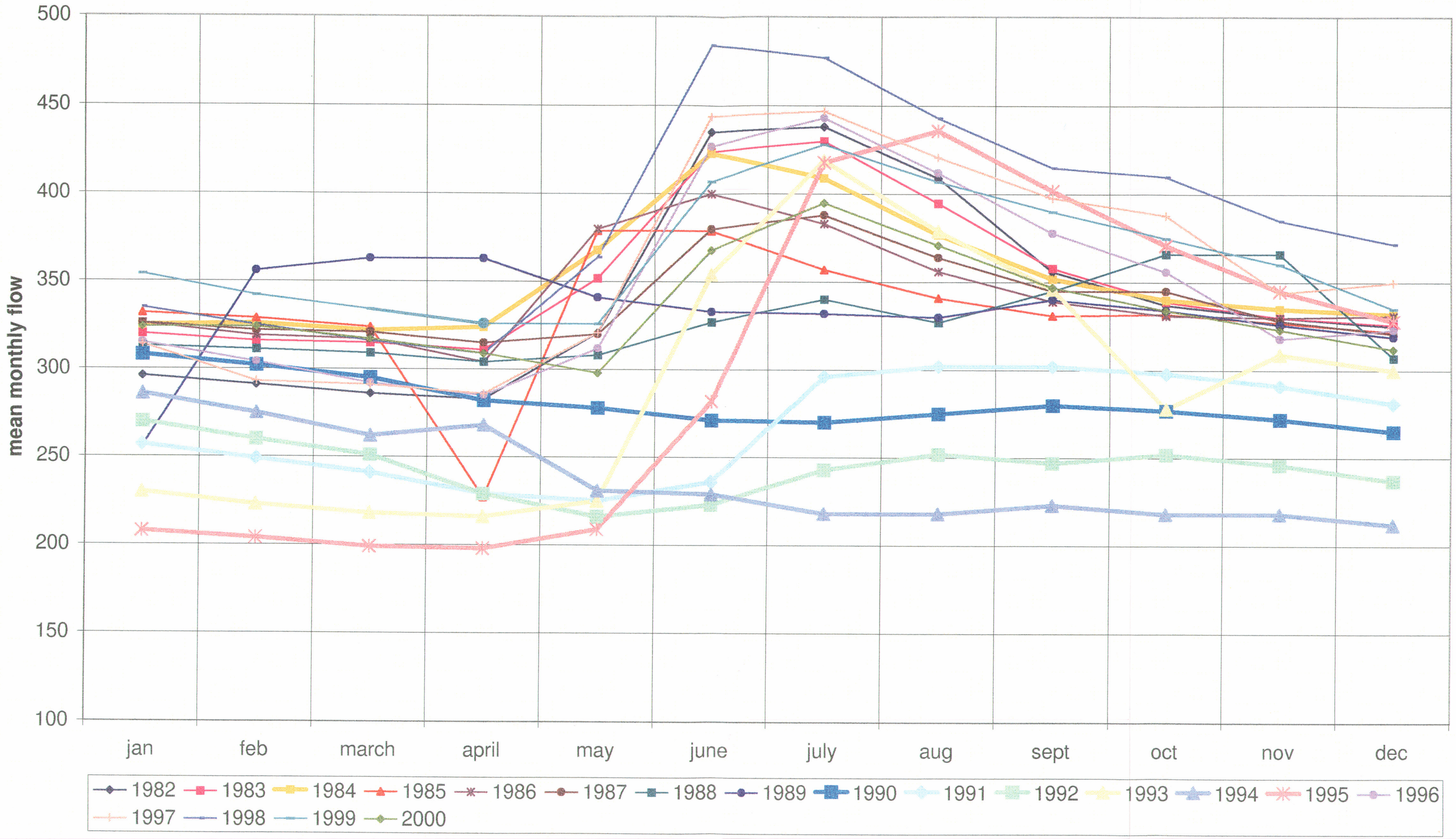
Two cross sectional areas were examined. The first was at the end of an access road to Mill Fork Canyon. The second was about one mile further up into Mill Fork Canyon.

The thickness of the s~~d~~aturated sediments was estimated to range from 0 to 30 feet in the lower study area. In the upper area the thickness of the saturated sediments was determined to range from 0 to 50 feet.

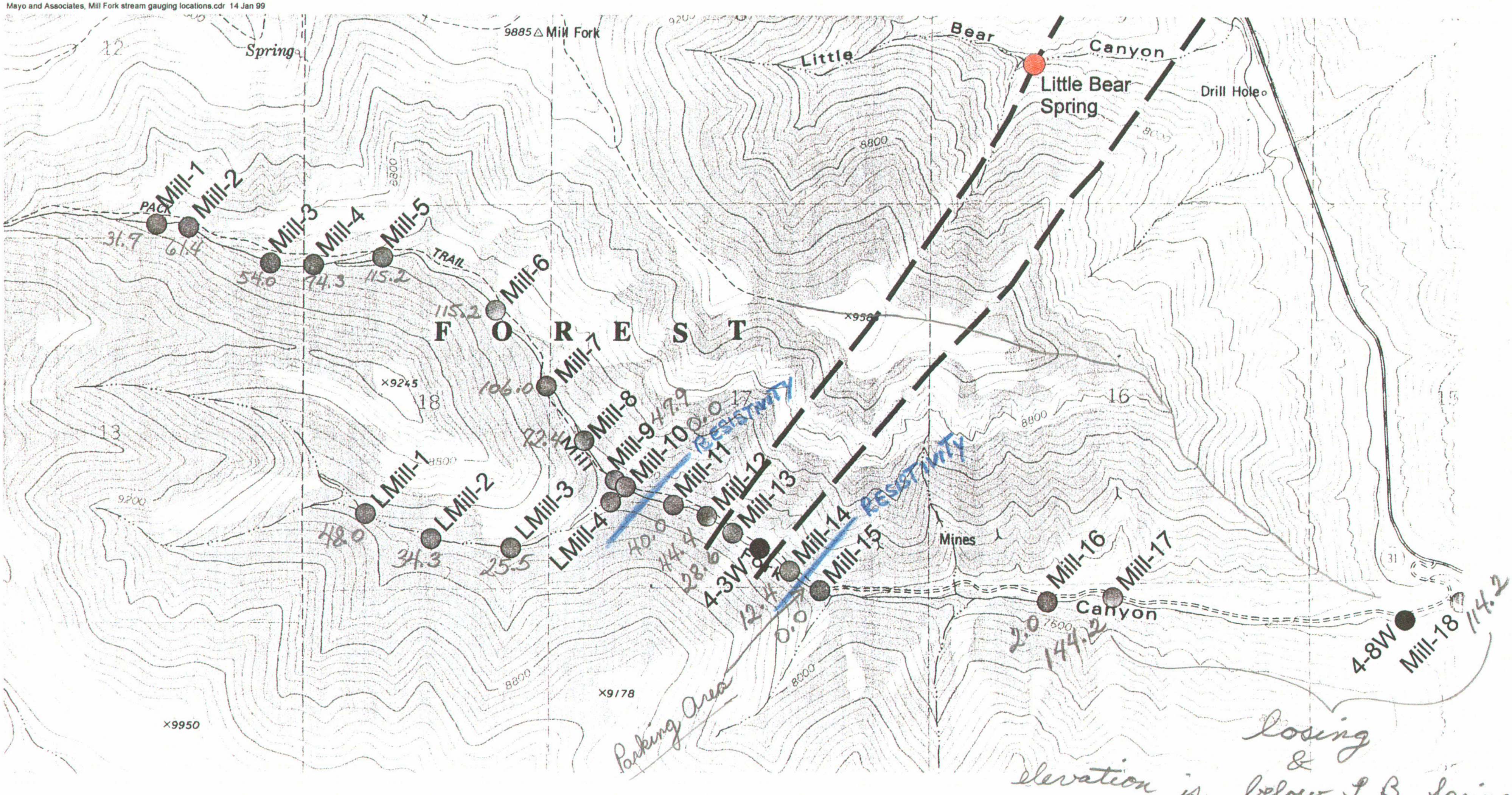
The cross sectional area of the saturated sediments was about 2,000 square feet at the lower resistivity profile and 3,300 square feet at the upper resistivity profile.

The survey also revealed that groundwater in the surveyed profiles flows from the canyon slopes to the canyon creek. Depth to groundwater in the surveyed area ranged from 0-30 feet.

The data indicates that there is an approximately 1,300-square-foot difference in area of saturated sediments between the two surveyed profiles.


500
450
400
350
300
250
200
150
100
mean monthly flow
jan
feb
march
april
may
june
july
aug
sept
oct
nov
dec
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

Mayo and Associates, Mill Fork stream gauging locations.cdr 14 Jan 99



October 1998

Mayo and Associates 1998 stream gauging location

Huntington No. 4 Mine water monitoring location

N

2,000 feet

Figure 7 Stream gauging and monitoring stations on Mill Fork Creek.

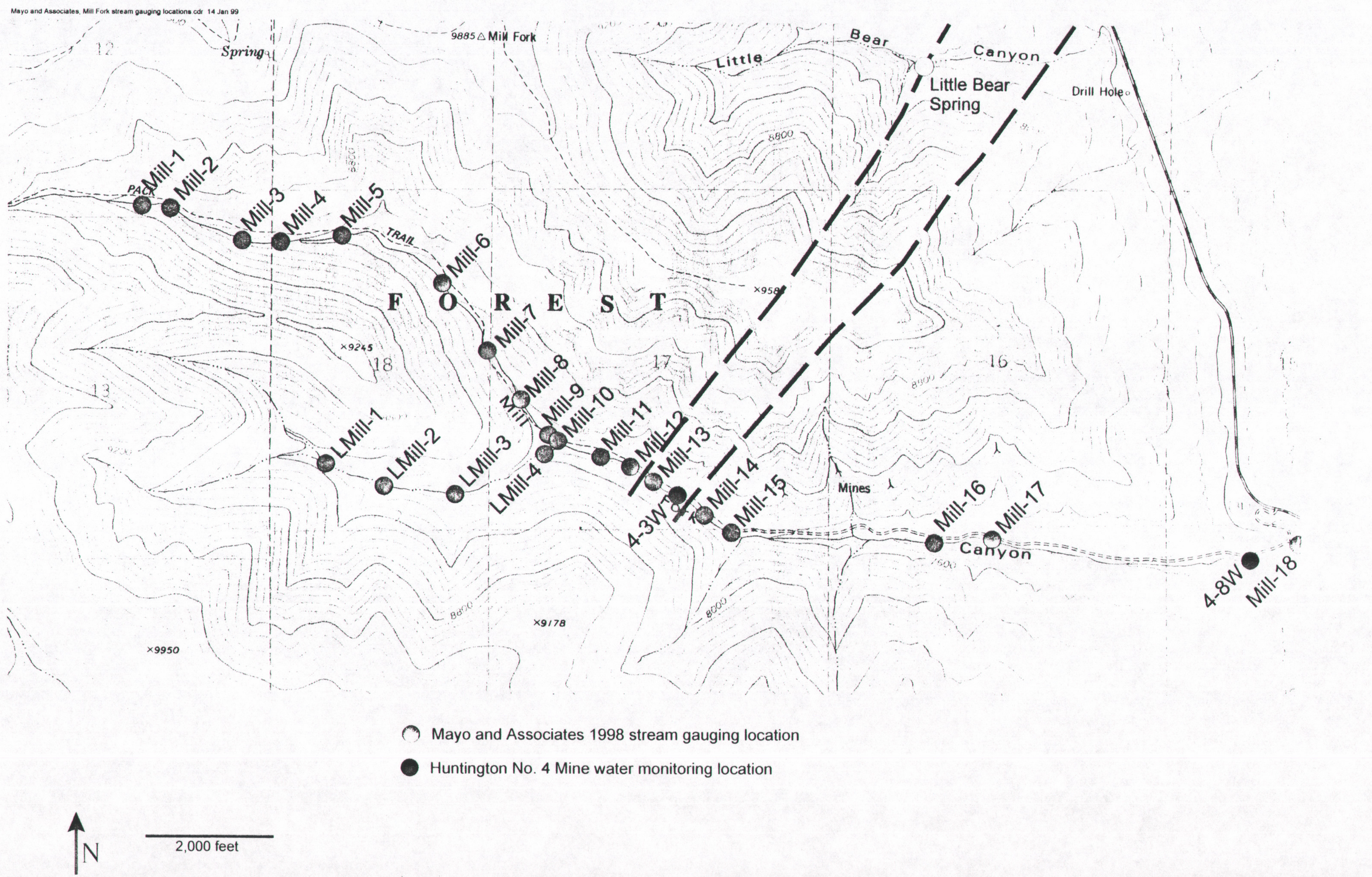


Figure 7 Stream gauging and monitoring stations on Mill Fork Creek.

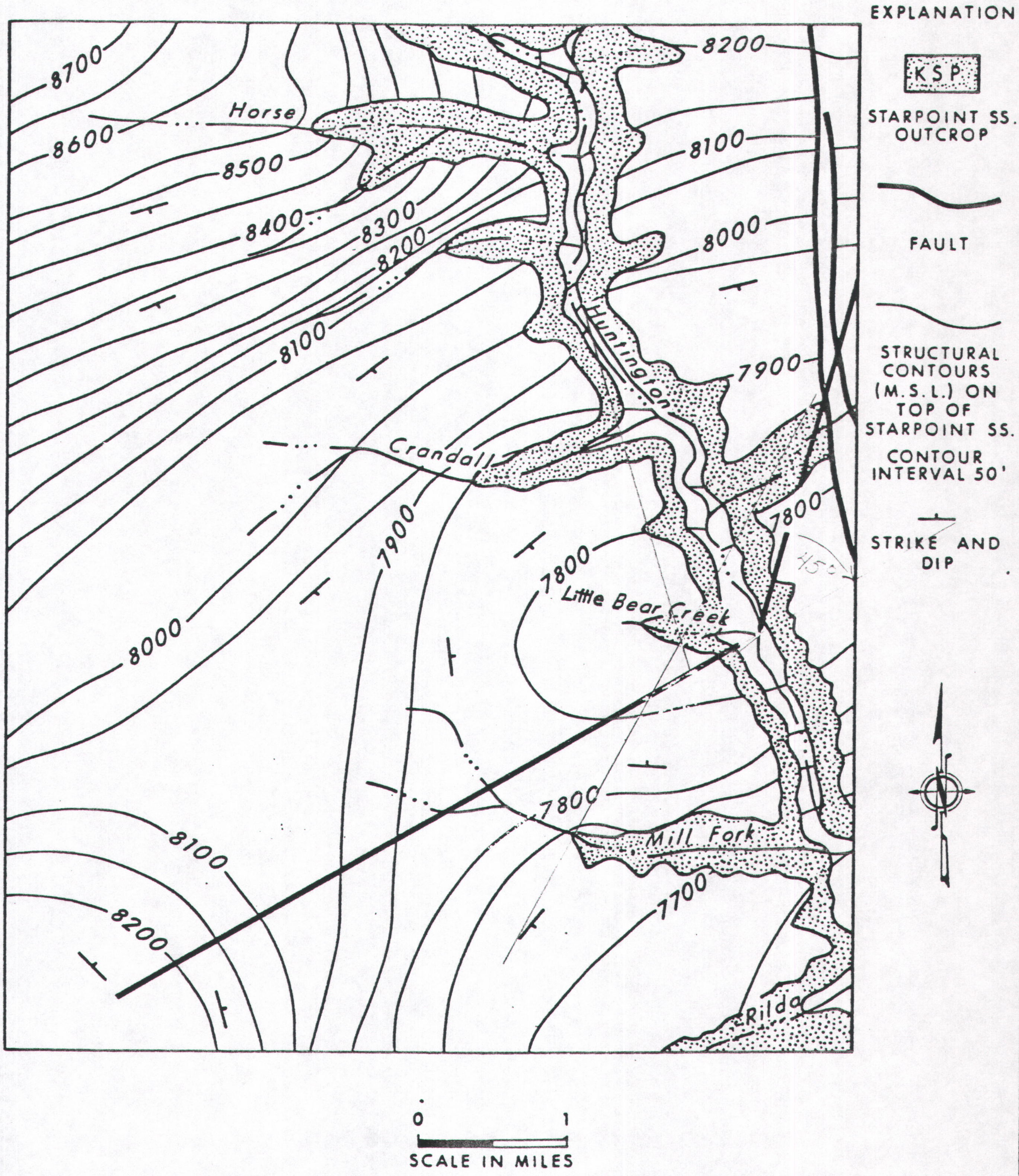


Figure. 7.2 Structural contours (M.S.L.) on top of Starpoint Sandstone (Edmund Spreker, U.S.G.S.)

D.H.R. 8/82

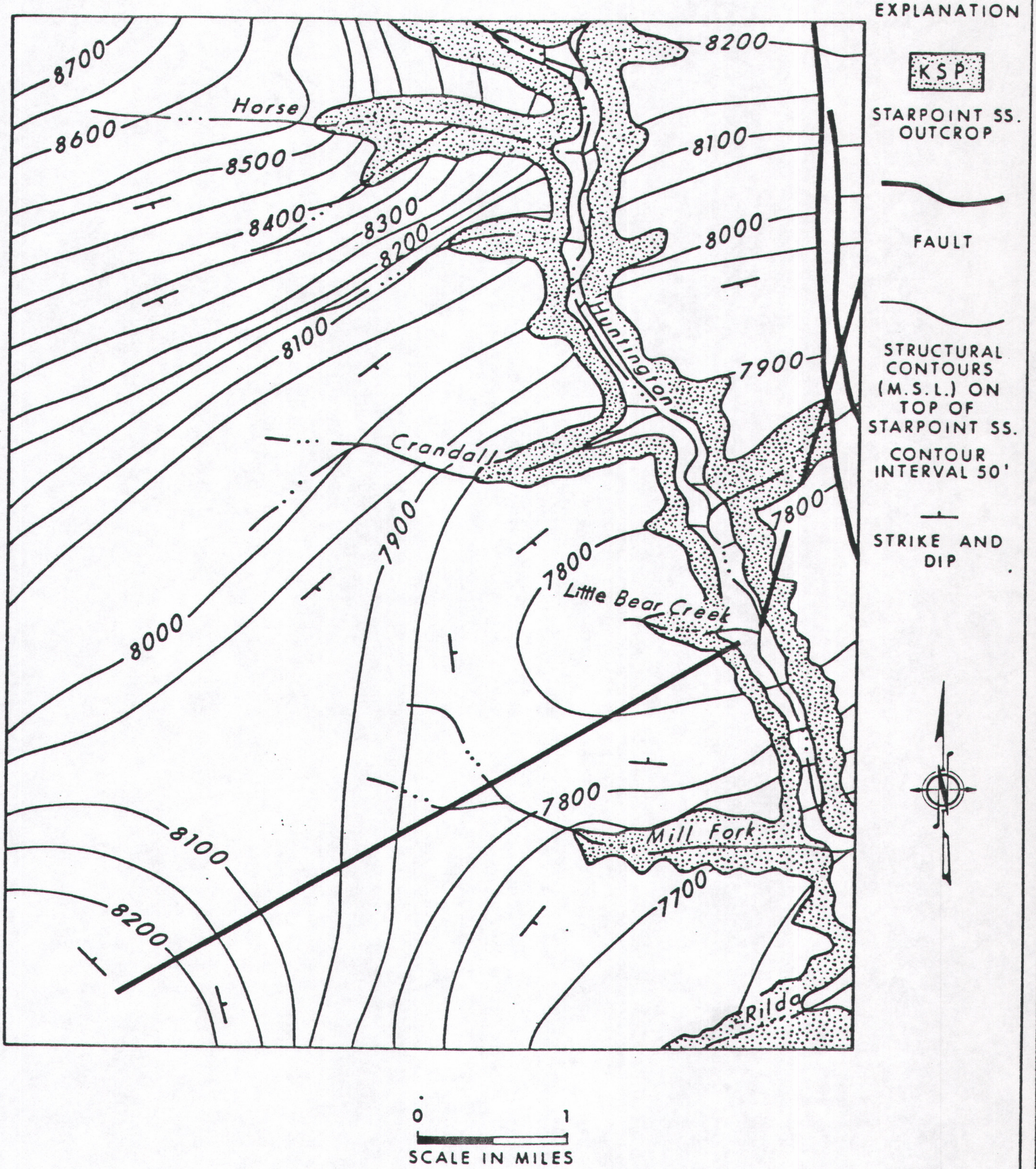


Figure. 7.2 Structural contours (M.S.L.) on top of Starpoint Sandstone (Edmund Spreker, U.S.G.S.)

D.H.R. 8/82

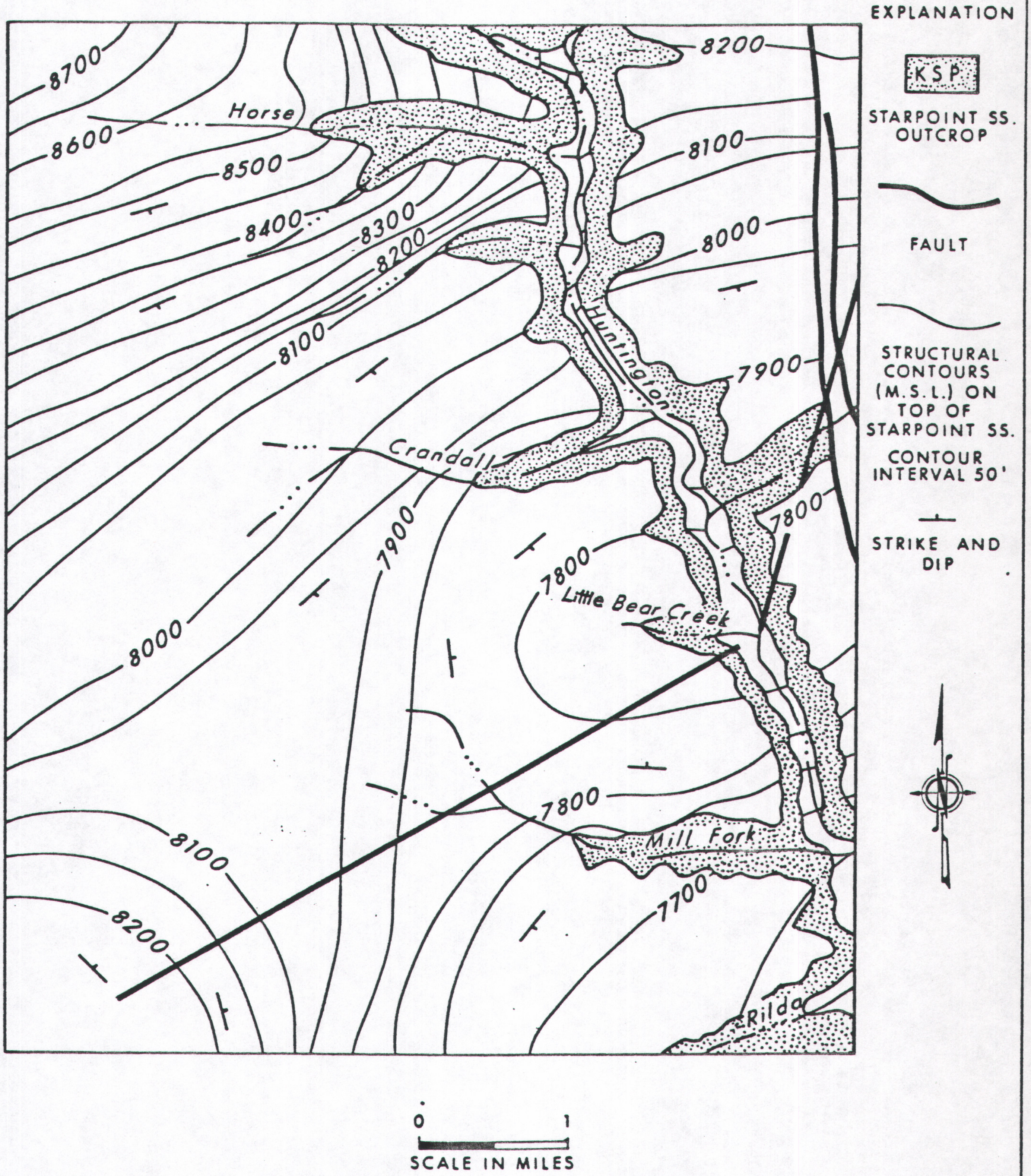


Figure. 7.2 Structural contours (M.S.L.) on top of Starpoint Sandstone (Edmund Spreker, U.S.G.S.)

D.H.R. 8/82